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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY, DIVISION OF MYCOLOGY AND DISEASE SURVEY
BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING
AGRICULTURAL RESEARCH ADMINISTRATION
UNITED STATES DEPARTMENT OF AGRICULTURE

Volume XXVIII | May 15, 1944 | Number 13

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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LATE BLIGHT AND OTHER DISEASES OF POTATO IN SOUTHERN STATES

LATE BLIGHT AND OTHER FACTORS AFFECTING POTATOES IN SOUTH CAROLINA: The week ending May 13 was spent in the Charleston vegetable area where an epidemic of late blight [Phytophthora infestans] was reported (C. N. Clayton, PDR, May 1).

To get a true picture of the condition of the potato and other crops in the Charleston area one must bear in mind the effects of the excess rainfall this spring. The water-table, which is normally only a few feet below the surface, was raised, inducing seedpiece decay. In some cases this continual flooding resulted in the destruction of 3 plantings. Almost all growers who planted twice had to replant a third time.

The seedpiece decay and the effect of the excess water on the roots of various vegetable crops was reported previously. In addition, in early April a frost killed most of the beans and even killed potatoes in many fields.

The excess water now has had a further effect of leaching most of the fertilizer, and the combination of seedpiece decay and loss of fertilizer has resulted in spindly plants and undoubtedly will limit the size and number of tubers produced.

The excess rain apparently has favored a considerable attack of blackleg [Erwinia phytophthora] so that many plants are yellow and slightly wilted. In addition, a bacterial stem rot, possibly blackleg, has set in in many of the plants damaged by frost. In a few cases the injury has been corked over, preventing invasion by bacteria, but in most plants the bacteria have proceeded down the frozen stem to attack and kill shoots that have sprouted from below since the freeze.

It was at this point that late blight attacked the crop. The disease is generally present; it was seen in every field visited. The damage varies from none to complete. In many fields plants have been killed by late blight before blooming. In most fields tops are still green; however, in previous epidemics in this area damage became most severe about June 1. The few fields seen that were planted after the rains and had not emerged when the frost occurred were damaged as badly as early-planted fields. As reported by Dr. Clayton, the present prospects are for 10% of a normal crop. Many growers have as much as $150 per acre invested in seed and fertilizer alone. -- R. E. Atkinson, Emergency Plant Disease Prevention Project.

LATE BLIGHT AND OTHER POTATO DISEASES IN NORTHERN FLORIDA: The potato-growing section of LaCrosse (Alachua County), where about 2700 acres were said to be grown, was visited on April 14 with the manager of the local growers' association. Plantings totaling 187 acres were examined in detail and others totaling about 200 acres in a general way. The fields were rather wet in general, as a result of recent heavy rains, and some plant damage occurred in a few local acres where drainage was not good. A few scattered fields showed injury to the plant tops from a late frost in early April, but in no case did this appear to be severe enough to affect the yield seriously. Most of the plantings were approaching maturity

and gave every indication of making a good crop.

Late blight (Phytophthora infestans) was severe and widespread in one 4-acre field of Red Bliss potatoes being dug early on account of the development of this disease. Tubers from this field, which were among the first to be harvested in this section, were mostly rather small because of immaturity. A trace of scab [Actinomyces scabies] was noted in those being run over the grading table. Some evidence of late blight was apparent in a few local areas in some of the larger fields visited but relatively little trouble was experienced from this disease in most fields as yet.

Brown rot (Bacterium [Pseudomonas] solanacearum) was observed to have caused about 5% plant loss in a 5-acre block of the Sebago variety in one field, but none was apparent in an adjoining block of the Katahdin variety. The grower reported that this disease had been much more severe in this field last year. Brown rot also was observed to be generally prevalent and quite destructive in local areas in another planting of about 35 acres, probably averaging about 20% for this field. The past history of potato growing in the LaCrosse section shows that this disease has been inclined to be troublesome for a number of years.

Certified seed was used for practically all the plantings in this section and all that were examined appeared free from virus diseases, merely a trace of leaf roll being found in one field.

An isolated 2-acre planting of potatoes at Orange Heights (Alachua County), examined enroute to Hastings on May 1, was characterized by a very poor stand. This planting was weedy and poorly cared for and apparently had never been dusted. Considerable late blight was developing on plants at one end of this field while they were still relatively young.

On May 2 to 4 the potato-growing sections of Hastings and Federal Point were visited. The vines at both these localities, as well as those in plantings about Palatka, had been dried up and dead for the past 2 or 3 weeks. Those at Elkton and Bunnell were reported to be in the same condition. About 65% of the potatoes grown in the Hastings section are of the Sebago variety. A total of 5.43 inches of rainfall occurred at Hastings during the last 10 days of March, which was followed by 3.16 inches in a 2-hour period on April 3. A total of 8.35 inches fell in a period of 2 weeks and the potato-growing areas in this section comprise rather low-lying land with none too good drainage facilities in time of heavy rainfall. A little late blight was present generally through the fields and during this period of heavy rainfall it spread rapidly and soon killed most of the plants. In fact, the fields were mostly too wet after the rains began to get into for dusting. The vines died mostly within a period of 2 weeks and from 2 to 4 weeks before maturity. The tubers were inclined to run rather small and the yield is estimated at about 1/3 less than normal.

According to Dr. A. H. Eddins, pathologist in charge of the Experiment Station's Potato Investigations Laboratory at Hastings, late blight was worse in this section this year than in any of the past 13 years since this laboratory was established. According to his conservative estimate at least 20% of the crop was destroyed by late blight.

In many cases the heavy rainfall washed the soil away from the tubers and left them exposed, which resulted in considerable loss from greening

and sunburning.

The tubers also became infected by late blight and this, coupled with the wet soil conditions, favored the development of soft rot (Erwinia carotovora), which resulted in a 10% additional loss. Shipments made immediately after the heavy rainy period developed from 10 to 90% loss from soft rot but loss from this trouble dropped rapidly as the soil dried out. This high loss from rot apparently was favored by the fact that the potatoes were packed and shipped while still wet after washing, there being no facilities at most packing houses for drying them. Most of these houses had discontinued washing about a week prior to my visit on account of the high loss that was being experienced from decay. A report that had just been received by the growers' association on a car shipped as late as April 26 stated that 17% decay was found on arrival, although this car had been certified by inspectors as showing no decay when packed for shipment.

Fully 2/3 of the crop has already been harvested in this section. -- Arthur S. Rhoads, Emergency Plant Disease Prevention Project.

LATE BLIGHT IN SOUTHWESTERN MISSISSIPPI: New outbreaks of late blight have occurred since the potato area was last visited, 2 weeks ago (PDR, May 1). For some reason or other the disease has not spread to any great extent in Marion County where many fields were observed with only a trace. However, along Pearl River and across it towards Tylerton and above in adjacent Walthall County many fields were completely wiped out. Infection was severe and extensive in Walthall County, where some 1500 acres are grown. In 16 fields surveyed damage was medium to severe. The loss evidently will be considerable since many of the plantings were still rather young. -- Douglas C. Bain, Emergency Plant Disease Prevention Project.

POTATO STORAGE DISEASES IN WISCONSIN

Edwin E. Honey

During the period from March 29 to May 6 inspection of potato bins in warehouses and on farms was conducted at about 300 locations in Portage, Waushara and Waupaca Counties. The varieties encountered and their relative frequency of occurrence, (but not necessarily their relative amounts of acreage) are given in Table 1.

The new varieties Sebago and Sequoia were generally grown in relatively small amounts, chiefly from 100- or 200-pound lots distributed by the County Agents beginning about 1941. This seed was originally certified, brought in from South Carolina and more recently from Maine. Some growers, obtaining such small lots in 1941, increased it and replanted with it the succeeding years but the acreage of these varieties has not as yet become extensive. Since some difficulty of disposing of red varieties later in the season was experienced by growers, there appears to be a tendency to cut down the acreage of red varieties unless a special market is available. Some early varieties, such as Triumph or Red Warba were found to be grown in small amount in gardens, whereas other varieties were grown in commercial amounts.

Table 1. Seed sources and varieties of potatoes grown in Portage and Waupaca Counties, Wisconsin.

Variety	Total Number locations Inspected	Seed source: Wisconsin Grown: Local: Own	Local: (Neighbor)	Dealers	County Agent	Muck grown	Junction City Area	Certified*	Out-of-State (Dakota or Mich.): Certified	Not certified	Source Undetermined
Chippewa	138	31.1	7.2	10.1	0.7	18.9	2.	10.2	1.4	2.2	15.3
Russett Burals	74	40.5	8.1		2.7				9.5	12.2	27.0
Sequoia	65	9.3	13.9		3.0			4.6	41.5**	1.5	26.2
Sebago	44	11.4	9.0+					6.8	66.0		6.8
Pontiac	43	18.6	28.0	4.6		18.6		2.3	9.3	9.3	9.3
Katahdin	40	25.0	7.5	22.5		2.5		15.0	5.0		22.5
Cobbler	36	19.4	5.6	2.7		14.0		16.6	11.1	5.5	14.0
Red Warba	35	22.9		5.7		31.4		11.4			28.6
Triumphs	6	66.6		16.7							16.7
White Warba	5	40.0				40.0					20.0
White King	3		66.7								33.3
Russet Burbank	2	100.0									
Early Ohio	1										100.0
Green Mountain	1										100.0

* Part of certified were introduced by County Agents
** 38.5% was introduced by County Agent.

During the period from February 29 to April 17 growers still had in storage a considerable supply of the 1943 crop. Beginning the week of April 17 Government purchase of potatoes to be shipped in open gondolas to Menominee, Michigan for dehydration and processing elsewhere into alcohol and mixed feed began to empty much of the 1943 crop still in farm and warehouse storage. Potato inspectors graded lots submitted into U.S. No. 1, U.S. No. 2, and culls, and the farmer was paid according to the average percent grade. Some lots of potatoes running up to 80% or more U.S. No. 1 were disposed of in this way. Many lots ran very low or with no U.S. No. 1.

Beginning with this disposal of potatoes, farm inspections frequently revealed only such potatoes present as had been bought or kept for seed, together in some cases with culls still undisposed of.

The disposition of cull potatoes appears to be important with relation to disease. It was found to be a common practice to leave many scabbed and blighted tubers or other culls in the soil at harvest time or later to distribute such tubers directly as fertilizer on fields. Building up such inoculum directly in the soil is not a good practice. In other cases such affected tubers were fed uncooked to cattle and thus returned to the soil through the manure. While it is a common practice to feed cooked potatoes to hogs, in some cases these were distributed uncooked on the field and the hogs allowed to eat them. Uncooked potatoes are fed to cattle. Also, potato cull piles frequently found near potato warehouses or on farms, constitute a menace as a source of inoculum for many diseases and harbor insect pests and disease vectors.

Where possible, records were made of seed sources (Table 1). A favorite practice with many farmers in Stockton, Buena Vista, Amherst, Lanark, Almond, and neighboring townships was to secure seed potatoes from either the Junction City area or from muck land in Bancroft or Plover townships and the vicinity of Plainsfield or Dousman, where many of the growers made a practice of obtaining certified seed or seed with a good history, growing it one year and selling for seed to these areas where it was planted on the upland. Of the 138 locations examined growing Chippewa in 1943, about 19% used this source. Thus, many growers obtain the northern-grown stock either directly or after being grown in their vicinity one year. A visit to the Junction City area showed that this local source of potato stock was discontinued because the farmers in this area had turned more to dairying because of their wet spring soil, the late blight problem, and the lack of labor. Also, dairy prices were more attractive.

About 31% of the Chippewa growers used their own seed, some of which may have been certified one or two years prior from Wisconsin, Michigan, or Dakota, or may have been obtained from a neighbor, dealer, or trucker, In 1943 11% of these growers used certified seed, for the most part from Wisconsin but some from Dakota. The origin of Chippewa seed stock was not obtained in about 15% of the cases.

Planting the 1944 Crop.

In general, the 1944 planting season is about 2 weeks or more behind that of 1943. By May 6, 1944 relatively few potatoes were in the ground. Growers were completing their oat seeding and preparing to begin potato

planting. A few exceptions to this general condition were one large grower in Portage County who had made an extensive planting of Cobblers on sandy loam soil on April 17, and a small grower in Waupaca County who put in one acre on April 13 just prior to the big snowstorm of April 14 and 15. A few growers around Almond in Portage County had started to plant by April 20 but most farmers began after this day. In 1943 all early potatoes were planted in the Almond area by April 20.

The trend in 1944 potato acreage appears to be somewhat less than 1943 in the case of smaller growers, whereas, the larger producers are planting as much or more.

Diseases Observed in Storage

Scab: In general scab [Actinomyces scabies] was quite severe, although in some bins only small amounts or traces were observed. In some cases early varieties, including Chippewa, escaped scab while late varieties, especially late Chippewa, Katahdin, Pontiac, Sebago, and Sequoia, were moderately to very severely scabbed. In some cases Russet Rural were severely scabbed, although this variety was in general more free than most of the others examined. Of all diseases scab appears to have caused the greatest amount of throw-outs and loss to the grower on the 1943 potato crop. Apparently in this part of the State, at least, the season of 1943 with its long period of hot, dry weather resulted in one of the most severe scab epiphytotics in many years except where irrigation, clean soil, and disease-free seedpieces coincided to give a clean crop.

Late Blight: Next to scab, late blight [Phytophthora infestans] was the most common disease encountered in potato bin inspection. Nothwithstanding little to moderate top infection during 1943, considerable tuber infection appeared in the bins, amounts arranging from 0 to almost 100. In general, growers employed more spray or dust against blight than in average years and this accounts for some blight-free potato bins. Some growers, gambling with chance, did not use a fungicide and where conditions were optimum escaped severe damage, but in most cases suffered a severe or nearly complete loss of the crop from late blight. Too little and too late applications of fungicides also were ineffective. In general, early varieties escaped blight. Probably the greatest loss from blight on tubers in storage was with the Chippewa variety. By selling early from the potato field many farmers escaped the loss from late blight that they otherwise would have taken if they stored for later sales.

Certain County Agents had introduced the Sebago and Sequoia varieties into these counties because they were believed to be more resistant to blight than the older varieties. While not immune they do appear to be more resistant. A number of growers expressed the decision to grow Sebagoes next year, chiefly because of this resistance and probably with the view of thus avoiding a fungicide. However, these varieties also require fungicidal applications as they are not immune.

Late blight functioned as one of the chief avenues of entry for various other storage rots.

Bacterial Ringrot: Special attention was given to bacterial ringrot [Corynebacterium sepedonicum] a tuber-borne disease spread by contamination of disease-free stock by contact with diseased stock or contaminated

equipment. An effort was made to acquaint the growers with the danger from this disease and of the sanitary measures to use in case of its occurrence. Five cases of bacterial ringrot was encountered in Portage and Waupaca Counties. Examination of the bins of one grower known to have had ringrot in Chippewas in the field last fall did not reveal the presence of this disease. This grower, on learning of its presence, had disposed of all his Chippewas from the field. About 450 bushels of Sebagoes and a few "throw-outs" of Russet Rurals only were left in his storage cellar and no evidence of ringrot was found at the time of examination.

Rhizoctonia: Relatively few cases of Rhizoctonia [solani] on examined tubers were observed, viz., less than 10% of the locations inspected, nor was the amount of Rhizoctonia scurf on the affected tubers great in the majority of cases. Exceptions were found where considerable occurred on muck grown Russet Burbank in Waupaca County and Sebago and Chippewa in Portage County.

Early Blight Rot: Very few cases of early blight rot [Alternaria solani] were encountered and these were chiefly on Cobblers and Chippewas.

Other Storage Rots: Included here are various rots common in Wisconsin storage. In general the causes result in a blackening and in some cases softening of the potato tissue. As a rule they enter the potato through late blight or scab lesions or through mechanical injuries made at harvest. Storage rots were as a rule found in from traces to moderate amounts depending largely on the character of the storage and presence of possible avenues of entry.

Yellow Dwarf: Yellow dwarf [virus] was found chiefly in the Russet Variety in from traces to moderate amounts. Only one case of severe infection was encountered. A trace of yellow dwarf was also found in Chippewa and Sequoia.

Spindle Tuber: Spindle tuber [virus] was observed in a relatively small percentage of the bins examined. It was found on Russet Rurals in traces to slight amounts and also in Chippewas and Pontiacs.

Stem End Discoloration from Fusarium was commonly encountered in from a trace to small amounts in Russet Rural, Chippewa, Katahdin, Pontiac, Sebago, and Sequoia.

Freezing: A considerable amount of loss results from frost injury. This may occur both in the field about harvest time and in winter storage. Certain varieties such as Katahdin growing near the soil surface or exposed are more commonly affected about harvest time and some such frozen or partially frozen tubers may be placed in storage. Such affected potatoes may be found scattered through the bin. In several cases, where unheated storage was used, considerable loss resulted from freezing of Cobblers, Chippewa, Katahdin, Pontiac, Russet Rural, and Sebago. One grower storing seed potatoes in an unheated cellar used straw as an insulator over the bins. On uncovering these in April it was found that this was inadequate protection and a large proportion of the tubers nearest the outside had frozen.

Stem-End Necrosis: Very little typical stem-end necrosis resulting from frost was observed.

Mahogany Browning: Mahogany browning and blotching resulting from long-time exposure to low temperatures (not freezing) was encountered in several

cases. The obvious cause was lack of sufficient attention to insulation in storage which results in a preventable economic loss.

Internal Necrosis (Non-parasitic): This condition was encountered in very few cases and was apparently induced by drought or high temperature.

Black Heart: Black heart caused by lack of oxygen was not enoountered.

Hollow Heart: Hollow heart was commonly encountered in many of the varieties. It was occasionally found in small-sized Russet Rurals but more commonly in large tubers of Sequoia, Katahdin and less frequently Chippewa. Large tubers of Pontiac were surprisingly free from hollow heart.

Hair Sprout: Hair sprout was encountered in only a very few cases.

Sprouting: In certain farm storages where temperatures were not held sufficiently low, premature sprouting of potatoes was considerable. This was true especially where the basement used for storage contained a house furnace.

Mechanical Injury: Mechanical injury, chiefly from digging and moving equipment or rough handling, was present in greater or less degree in every bin examined. Mechanical injuries served as points of entry for storage rot fungi and also lowered the grade.

EMERGENCY PLANT DISEASE PREVENTION PROJECT.

REPORTS ON DISEASES OF GREENHOUSE CROPS

CONDITION OF GREENHOUSE CROPS IN MASSACHUSETTS: Greenhouses in the Boston, Massachusetts area were visited in company with Dr. Emil Guba of the Waltham Field Station, during the period ending May 13. Since a similar survey was made just a month ago generally dry warm conditions have prevailed and there has been very little disease development in the intervening period.

Tomatoes. Leaf-mold (Cladosporium fulvum) was found in only 3 houses. There has been very little development of leaf mold and where present it is confined to the lower leaves of the plants causing no noticeable damage.

Root and crown rot (Rhizoctonia solani) was present in 4 houses. In 3 houses only a trace was present, but in the fourth house between 5% and 10% of the plants were killed.

Fusarium wilt (F. oxysporum f. lycopersici) had been present in one house for sometime and the plants were apparently outgrowing the infection with no commercial loss.

Mosaic (tobacco virus) was present in 11 houses. No appreciable loss could be determined.

Streak (virus) was found in slight amounts in one house.

Cucumbers. Eighteen houses of cucumbers were visited. In one house a slight amount of mosaic (virus) was present. Otherwise the cucumber houses appeared disease-free and except for the red spider very little difficulty was being experienced.

Carnations. Wilt (Fusarium culmorum) was found in one house causing a loss of about 15% of the plants of the Puritan and King Cardinal varieties.

Rust (Uromyces caryophyllinus) was found in one house but to date no serious damage could be attributed to it. -- R. C. Cassell, Emergency Plant Disease Prevention Project.

A SURVEY OF TOMATO AND OTHER PLANTS IN GREENHOUSES IN NORTHERN WEST VIRGINIA: In company with R. S. Marsh, Head, Department of Horticulture, West Virginia University, 11 greenhouses in the northwestern portion of West Virginia were visited May 4 to 10. Special attention was paid to tomato plants grown for sale. In the region around Wheeling vegetable plant production occupied a very small percentage of the area under glass; most houses were concentrating on flower production. This was in contrast to conditions in Charleston, Huntington, and other West Virginia cities where emphasis has been placed on vegetable plant production. Tomato: Of the tomato plants seen, Marglobe was the most common variety. Beefsteak, Break O'Day, Ponderosa, Pritchard, Stone, and many other varieties were found in small quantities.

Mosaic (virus) was not found on the tomato plants examined in the northern part of the Ohio Valley.

In the greenhouse near Morgantown previously reported as infested with tip-blight (virus) (Leach and Berg, PDR 26:278. 1942), thrips control measures have been fairly successful in control of this disease. A very few affected plants, approximately 0.1%, have developed during the last few days. Tip-blight has not been observed in any other greenhouse in West Virginia.

Damping-off was severe in potted tomato plants in 2 houses. Here excessive moisture due to roof leaks appeared to be the chief favoring factor.

In a house held under highly humid conditions for rose production, one large bed of tomatoes were being grown for fruit. In one-half of the bed planted to Bonny Best all but the terminal leaves were heavily infected with Cladosporium fulvum. In the other half of the same bed Michigan State Forcing tomatoes showed no leaf mold.

Peppers. Many greenhouse operators complained of damping-off in this crop; very few practised seed treatment.

Carnation. Rust (Uromyces caryophyllinus) was severe in one house held at high humidity. -- Carlton F. Taylor, Emergency Plant Disease Prevention Project.

SCLEROTINIA ON GREENHOUSE CHRYSANTHEMUMS IN VIRGINIA: In the Norfolk area, according to Dr. G. K. Parris of the Virginia Truck Experiment Station, Sclerotinia sclerotiorum caused a loss of 100% in some beds and a total loss of approximately 50% in one set of greenhouses during the winter. -- Carlton F. Taylor, Emergency Plant Disease Prevention Project.

VEGETABLE DISEASES IN CALIFORNIA

Horace L. Barnett

Sacramento Valley: The survey work during the week ending May 6 was carried on in certain parts of the Sacramento Valley. One day was spent with Dr. L. D. Leach in the area south of Sacramento where extensive acreages of garden beets and carrots are being grown for seed.

Mosaic (virus) was the most common disease found on Beets. The amount of infection ranged from a trace to nearly 100% in the different fields. Considerable difference in the severity of infection was found in different fields planted from the same root bed. This would indicate that at least some of the infection took place in the field. This was further borne out by the differences in the severity of infection of the plants in the same field. Some of the plants were severely stunted while others showed no apparent stunting ahd had apparently been infected more recently. Reduction in yield will no doubt occur in the most severely infected plants.

Downy mildew (Peronospora schachtii) was present in variable amounts in the fields observed. Several systemically infected plants were seen in one field. These produced no seed. Some flowers and flowering stalks were found to be infected. The total reduction in seed yield due to downy mildew will probably be slight in most fields.

Only a trace of curly top (virus) was found in the beets.

Another disease of beets that was found in some fields was characterized by necrotic spots often assuming the form of rings. This was often accompanied by an abnormal increase in red pigmentation of the leaf. The cause of the trouble is unknown.

In the Carrot fields traces of bacterial soft rot (Erwinia carotovora) and watery soft rot (Sclerotinia sclerotiorum) were found. Aster yellows (virus) was found to be important in only one field where it was causing considerable damage. The plants varied greatly in the severity of infection, indicating that some of the plants may have been infected in the root beds and that some spread had occurred in the field.

Coastal Area: During the week ending May 13, a trip was made into the coastal areas from San Francisco to Santa Barbara. This trip was intended as a general survey of the plant disease situation of the crops near the coast. More time was spent in fields of vegetables than in any other group of crops. Little time was spent in the Salinas Valley since that area was visited recently. The counties included in this trip were San Mateo, Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara. Throughout the area very few diseases were seen that could be said to be causing any important losses at the present time. Lettuce and peas were the more important crops being harvested at this time. Smaller amounts of spinach, cauliflower, broccoli, and cabbage were also being cut.

Peas. Downy mildew (Peronospora viciae) [P. pisi] could be found in almost every field. In general the infection was light and mainly confined to the lower leaves. Some infections of the upper portions of the plants were seen. There was little loss from this disease.

Ascochyta blight was also commonly seen but was usually present only on the lower portions of the stems. Very little pod infection was in evidence.

The pod-deforming pea mosaic (virus) was widespread and common along the coast and was causing some loss in certain areas. This was the most prevalent disease found on peas, but in most places the losses attributed to it were not great. Both the staked and the bush varieties in the Arroyo Grande district had been heavily dusted for the control of aphids and were almost free from the mosaic. Only a few diseased plants could be found.

A pod and seed rot (apparently caused by a species of Pythium) was found in one field of seed peas near Santa Maria. Many pods in contact with the soil were infected, usually at the stylar end. The identity of the fungus has not yet been definitely determined.

Frost damage of peas (which occurred earlier in the season) was found to be severe only in a few small fields near Pismo Beach.

Lettuce. Lettuce drop (Sclerotinia sclerotiorum) is apparently becoming more important in the Salinas-Watsonville district as the season progresses. Losses in several fields were approximately 6 to 8%. Many fields showed only a trace. It was reported that lettuce heads infected with S. sclerotiorum were coming into the packing sheds at Salinas. The disease was less severe at this time in the Santa Maria Valley where the heaviest infection seen was approximately 5%. S. minor was also found on lettuce in one field near Watsonville.

According to the County Agricultural Commissioner's office at Salinas, the disease called crown necrosis of lettuce which was recently reported from the Salinas Valley (PDR, May 1) has shown little or no increase in the past few weeks. Its appearance has not been reported in any new fields.

Downy mildew (Bremia lactucae) was common in all areas but serious in none.

Spinach. Root rot (Phytophthora megasperma) was found in one field near Soledad. The infected plants were confined to a low area approximately 100 feet in diameter. This represents the third area in the State in which this root rot has been reported on spinach. No doubt it is of rather common occurrence.

Carrots. The carrots in the Soledad area were examined for the presence of bacterial blight or scab (Phytomonas [Xanthomonas] carotae) on the roots. The disease was easily found in several fields. E on some of the younger plantings showed numerous root infections. Judging from its prevalence at this young stage in the development of the carrots, it may be expected that the disease may become severe before the end of the season.

Crucifers. Young plants of cabbage and brussels sprouts in the plant beds were found to be lightly infected with ringspot (Mycosphaerella brassicicola) and downy mildew (Peronospora parasitica). Light infections of downy mildew were also seen on older cabbage and cauliflower in the field.

In one field of cauliflower ready for harvest approximately 25% of the plants were infected with mosaic (virus). A number of plants with root rot (Phytophthora megasperma) were also present in the same field.

Much of the older cabbage in the Salinas area has bolted and produced

flower stalks instead of forming solid heads. This condition was attributed to unfavorable growing conditions this spring.

Artichokes. Leaf spot (Ramularia cynarae) was prevalent in all fields examined. The degree of infection was variable but the damage to the plant was considered slight.

Artichoke mosaic (virus) was found in one field in the Santa Maria Valley. A number of scattered infected plants could be found in this field. (See also PDR 27:714). The infected plants were extremely dwarfed, with mottled leaves. The flowering stalks were short and the "chokes" were small and unmarketable.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

OTHER REPORTS ON DISEASES OF VEGETABLES

BEAN DISEASES IN SOUTH CAROLINA: The week ending May 13 was spent in the Charleston vegetable area. Conditions affecting crops are described in the report on potato late blight above. All beans are small and yellow, although many are blooming, presumably the effect of leaching of the fertilizer by the excess rain. A trace of bacterial blight [? Xanthomonas phaseoli] was found in some fields. Rhizoctonia [solani] canker and Sclerotium rolfsii were found on scattered plants in several fields.

The 42 acres planted with anthracnose [Colletotrichum lindemuthianum]-infected bean seed, reported previously, were interplanted with healthy seed. The infected plants were plowed up and an attempt was made to rake them off. As was anticipated, the plants from the disease-free seed are now almost as heavily infected as those from the infected seed. Stem lesions are very common. The upper leaves, however, are now free from infection. -- R. E. Atkinson, Emergency Plant Disease Prevention Project.

BEAN ANTHRACNOSE IN LOUISIANA: An outbreak of anthracnose occurred in a victory garden at Baton Rouge. The seeds were obtained from one of the local seed houses. This disease is rarely found in Louisiana. -- Douglas C. Bain, Emergency Plant Disease Prevention Project. May 8-13.

AN UNUSUAL INJURY TO CABBAGE PLANTS IN VIRGINIA: The plant-growing section near Franklin was visited on April 24. In this area cabbage seed is sown in October, the plants are grown unthinned in the open field during the winter, and pulled from January to April for shipment as "frost-proof" plants. No protection is given these plants and mortality reportedly has been high during severe winters.

Several complaints had been received by the Virginia Extension Service regarding the quality of cabbage plants shipped from the Franklin section this spring. Some of these plants had developed soft rots of the stem during transit and were in poor condition. Examination of these fields revealed that many of the plants had swollen stems, above ground, in which the pith had disintegrated, in some cases adventitious roots having developed into the hollowed region. In other stems no swelling was apparent, but the stems bore evidence of healed cracks and the pith area was discolored. Observations indicated that the injury was most severe on those

plants grown in locations favoring more vigorous growth during the fall. It was more prevalent in low areas and in heavily manured or fertilized areas of fields. The most severely affected field (1/3 of the plants injured) had received 1000 pounds per acre of 6-10-6 fertilizer prior to seeding. Of the approximately 70 acres of fall-seeded cabbage plants, at least 20% of the plants had been injured. Pulling of the over-wintered plants would be completed during the week of April 23 so that for this season the trouble has ended.

The writer examined these fields on January 30 and observed at that time fresh splitting of the stems above ground level on many plants. At that time this injury was considered to be due to recent frosts that had split the most succulent stems, but had not been sufficiently severe to kill the plants.

The current trouble was attributed to freezing injury suffered during the winter, probably during January, a diagnosis agreed with by Dr. H. H. Zimmerley of the Virginia Truck Experiment Station at Norfolk, and by members of the Department of Plant Pathology at the Virginia Polytechnic Institute, Blacksburg. Dr. Zimmerley suggested that the reason such plants were not more commonly found was that freezing injury rarely reached this point without killing the plants. Members of the Division of Vegetable Crops and Diseases, USDA, were of the opinion that the injury on the plants submitted by the writer was due principally to the plants being held too long in a crowded condition. -- Carlton F. Taylor, Emergency Plant Disease Prevention Project.

ONION DOWNY MILDEW IN NEW YORK: The first onion downy mildew (Peronospora destructor) spores are now being formed on backyard plantings of winter or perennial onions. About 60% of the plantings observed in the past have been found to be diseased; plantings within a few miles of muck lands showing higher percentages of infection and those more distant being less frequently affected. -- A. G. Newhall, New York State College of Agriculture, Weekly News Letter May 8.

REPORTS ON DISEASES OF TOBACCO, COTTON, AND SUGAR BEETS

CONDITION OF TOBACCO SEEDBEDS IN THE WINDSOR-SUFFIELD AREA OF CONNECTICUT: Some time was spent with Dr. P. J. Anderson, Pathologist of the Connecticut Tobacco Substation at Windsor, inspecting tobacco seedbeds in Windsor, Windsor Locks, Poquonock, and Suffield. It was found that the seedbeds were surprisingly free from disease. Practically all growers in the area had sterilized the beds and were now spraying the small plants. Practices of tobacco growing are well developed in this area and most growers are ardent followers of the advice and practices recommended by the Windsor Substation. Tobacco growing has been an important industry on the Windsor Plains for a long time and the area now has the largest concentrated "Shade tobacco" acreage in the world. Approximately 1000 acres are annually grown under tents of cotton cloth.

The season in the Connecticut River Valley has been comparatively dry

and warm this spring. As a result the tobacco seedbed diseases usually encountered have failed to develop this year. The only seedbed disease found was an isolated inconsequential case of damping-off and rootrot caused by Pythium debaryanum. Probably the most widespread damage to seedbeds at present has been caused by cutworms, but even this loss is comparatively light. Occasional injury caused by improper distribution of fertilizer was also noted. -- Robert C. Cassell, Emergency Plant Disease Prevention Project. May 7 - 13.

TOBACCO SEEDBED SURVEY IN TENNESSEE AND KENTUCKY: The tobacco bed survey was continued in the vicinities of Springfield, Tennessee, accompanied by Mr. Dennis Latham, and Hopkinsville to Russellville, Kentucky. In about 28 beds of burley and dark tobacco around Springfield Pseudomonas tabaci was found in just one bed which had been reported as having downy mildew. This was an old bed site, not treated, and wildfire was severe. Seen were traces of angular leaf spot [P. angulata] and a few spots where the plants were being killed by Rhizoctonia and perhaps other fungi. Cold injury was quite evident, sometimes killing considerable leaf area.

In Kentucky about 7000 square yards of beds were observed with plants with leaves the size of a half-dollar to setting size. Angular leaf spot was found on 2700 square yards. Usually it occurred in light amounts but it was abundant and killing the plants in a few large areas in 500 yards of second-year bed sites in a woods. The beds had not been treated with Bordeaux but lime had been applied recently. Considerable cold injury occurred here and it was reported for downy mildew but none of the latter disease had been seen to date. Wildfire was found on one old bed site in the woods. Considerable cold injury was observed. --R. A. Hyre, Emergency Plant Disease Prevention Project. May 9 - 12.

COTTON DISEASES IN MISSISSIPPI: The Delta area and the southwestern section were visited during the week ending May 13. Heavy rains and floods during the past 2 months have seriously interfered with the planting of crops, particularly in the Delta area, where planting of cotton and corn has been delayed from 3 to 5 weeks. Cotton was being planted this week in many places; however, there were many fields in which cotton was just beyond the cotyledonary stage.

In all sections where cotton was up, sore-shin (Corticium sp.) was in evidence. Dead plants varied from a trace to well over 5% in different fields. In one large field in Sharkey County, the roots of every other plant pulled up were completely rotted, although above ground the plants appeared to be normal. An unidentified leaf (cotyledon) spot was not uncommon, especially in Walthall County. -- Douglas C. Bain, Emergency Plant Disease Prevention Project.

DOWNY MILDEW ON SUGAR BEETS IN CALIFORNIA: During the week ending May 13 a trip was made into the coastal areas from San Francisco to Santa Barbara. Sugar beets throughout the area were found to be relatively free from disease. Traces of downy mildew (Peronospora schachtii) were found in most fields but the damage was negligible. -- Horace L. Barnett, Emergency Plant Disease Prevention Project.

DISEASES REPORTED ON CEREALS AND GRASSES

PENNSYLVANIA: During the period May 8 to 15, fields of pasture grasses and winter wheat were examined for plant diseases in the following central and eastern Pennsylvania counties: Centre, Northumberland, Dauphin, Lycoming, Clinton, Huntingdon, York, Lancaster, Chester, Montgomery, Bucks, Lehigh, Northampton, Luzerne, Wyoming, Susquehanna, and Bradford. Dr. K. W. Kreitlow, of the U. S. Regional Pasture Research Laboratory, State College, assisted in the survey and in the identification of plant disease specimens.

Wheat. In general winter wheat was in good condition and was mostly in the first and second joint stage. A bare trace of powdery mildew (Erysiphe graminis) was observed in widely scattered fields. Septoria tritici was noted in fields near Woodward and Montandon but not elsewhere along the route. Leaf rust was not found.

Kentucky blue grass (Poa pratensis). Helminthosporium leaf spot (H. vagans) was prevalent on plants in fields located in all the above counties; severity on different plants ranged from a trace to light infection. Smut, caused by Ustilago striaeformis, was found in almost all pastures and along the roadsides over the entire route. In many pastures the disease was very destructive. Urocystis agropyri was found on plants in one field near Allentown. Sclerotium rhizodes was rather destructive to pasture blue grass in a field on the Pennsylvania State College Pasture Research Farm near Montrose.

Canada blue brass (Poa canadensis). Scolecotrichum graminis was particularly destructive to roadside grass near Yocumtown and Lake Carey, and was noted at many points along the entire route followed.

Orchard grass (Dactylis glomerata). Stagonospora leaf spot caused by S. subseriata was everywhere prevalent but appeared more destructive in central and southeastern than northeastern Pennsylvania. Scolecotrichum graminis and Ustilago striaeformis were noted on orchard grass near Allentown.

Timothy (Phleum pratense). Smut caused by Ustilago striaeformis was widely prevalent in central and southeastern Pennsylvania; counts of smutted culms in different parts of a field near Yocumtown showed that infection ranged up to 25%.

Meadow fescue (Festuca elatior). Net blotch, caused by Helminthosporium dictyoides, was prevalent on meadow fescue in fields and along roadsides over the entire route. Particularly destructive infection was noted near West Chester, Paoli, and Allentown.

Rye grass (Lolium perenne). Bacterial leaf spot, caused by Pseudomonas coronafaciens var. atropurpurea, was destructive to brome grass in a field near Montrose.

Red top (Agrostis alba). Sclerotium rhizodes and Ustilago striaeformis were noted on red top on the State College Pasture Farm near Montrose.

Quackgrass (Agropyron repens). Bacterial leaf spot was moderately severe on quackgrass near Howard. -- Leon J. Tyler, Emergency Plant Disease Prevention Project.

SOUTH CAROLINA: The week ending May 6 was spent in 4 of the most important grain-producing counties of South Carolina: Anderson and Greenwood in the Piedmont, Orangeburg and Calhoun in the southern Coastal Plains. Cereals have all headed and some rye was in the soft dough. The most advanced of the other cereals were in the milk stage.

Wheat. In the Piedmont the most common troubles are mildew [Erysiphe graminis] and speckled leaf blotch (Septoria tritici). Leaf rust [Puccinia rubigo-vera var. tritici] is present but is severe only in a few fields. In the Coastal Plain mildew and rust are severe in almost all fields. In a few fields Septoria nodorum has killed the leaves and the fields are brown as they become in a severe stem rust epidemic. Of 30 wheat fields inspected, 6, all in the Piedmont, had speckled leaf blotch killing the lower leaves; 10 had severe rust and powdery mildew with damage an estimated 30%; 6 had severe glume blotch (S. nodorum). In only 2 mildew was of minor importance; in 3 others mildew alone was causing heavy damage. A trace of loose smut [Ustilago tritici] was seen in only 3 fields.

Oats. Oats were ripening fast and more of these fields were inspected. Smut [Ustilago spp.] is seen in about half of the fields; often 20% of the heads are smutted. The average for all fields would be about 5%. Helminthosporium leaf spot is found in all fields; however, it may be very abundant in fields making a high yield and it is hard to say it is causing severe damage even though the leaves are badly spotted.

Crown rust (Puccinia coronata) was found in only 3 fields and in only one of these was it affecting the yield importantly. Halo blight [Pseudomonas coronafaciens] was found in 3 of the 40 fields inspected; it was not causing damage in any of these fields.

The most widespread and perhaps the most damaging or at least potentially damaging disease observed on oats was anthracnose (Colletotrichum graminicolum) which was found in every field in Orangeburg and Calhoun Counties. The plants are all infected but probably 20% have lesions on the culm that can be expected to weaken the straw and cause lodging; the rest have leaf blade and sheath infections.

Rye. Only 13 fields of rye were seen. Rust and a leaf spot presumably caused by Helminthosporium sp. were the most common diseases. Scolecotrichum graminis was found in only one field. Leaf rust (Puccinia dispersa) [P. rubigo-vera var. secalis] was present in 10 of the 13 fields, but only in 6 was it causing severe damage. Colletotrichum graminicolum was found in one field causing a sheath and stem spot of minor importance.

Barley. Only 7 fields of barley were inspected. Powdery mildew was present in all of these and in many it had already killed all the leaves. Stripe (Helminthosporium gramineum) had killed 5 to 10% of the plants in 4 fields. One field had 5% covered smut [Ustilago jensenii] by count. Head blight (undetermined) varied from 10 to 80% of the heads infected. All of these fields were in Anderson County.

Grasses. Leaf spot (Septoria sp., ? bromi) was very severe in one field of brome grass. Scolecotrichum graminis was commonly found causing leaf spot of Hordeum pusillum, a roadside grass weed.

During the latter part of the following week the cereal disease survey was continued in Williamsburg and Florence Counties of eastern South Carolina. In Williamsburg County the cereal diseases are the same as those

encountered in Orangeburg and Calhoun Counties, the most damaging diseases being anthracnose on oats; rust, mildew, and glume blotch on wheat; and blight and stripe on barley.

In Florence County, however, instead of anthracnose, a severe infection of foot rot caused by Helminthosporium sativum was found in several fields of oats. In a field on the Pee Dee Experiment Station 20% of the plants were killed by this fungus; half of these were fallen over. The stem was completely rotted, usually at the first node above the soil line. Leaves and sheaths were badly spotted by a species of Helminthosporium that was sporulating abundantly on these large, round, brown spots. H. sativum was abundant on the rotted stems and on the dead plants.

Colletotrichum graminicolum was found in one field of wheat, causing a sheath and stem canker. -- R. E. Atkinson, Emergency Plant Disease Prevention Project.

MISSISSIPPI: During the week ending May 13, the Delta area and the southwest section were visited. Heavy rains and floods during the past 2 months have seriously interfered with the planting of crops, particularly in the Delta area, where the planting of corn has been delayed 3 to 5 weeks.

Oats. A considerable acreage of oats is grown throughout this section of the State. In general, the crop is in good condition except, of course, where considerable damage was done by floods. In every field observed, a trace of loose smut (Ustilago avenae) was found. Leaf spot (Helminthosporium sp.) was found to be common. Crown rust (Puccinia coronata) also is common but appeared to be more abundant on maturing plants.

Barley. Only 2 large fields of this crop were seen; one in Sunflower County near Greenwood and the other at Stoneville. A trace of loose smut (Ustilago nuda) was noted in both fields. Leaf spot (Helminthosporium sp.) was general in the field near Greenwood. Leaf rust (Puccinia anomala) was common in the planting at Stoneville. An interesting condition was noted in plants at the latter locality. The heads on about 25% of the plants were bent to an angle of 90° and more. The first internode of the inflorescence was considerably elongated (up to 2 cm), and the node itself was somewhat enlarged externally. The whole area was brittle. Grain development in these heads was not normal and the plants in general were only 1/2 to 2/3 as high as normal plants. There was no evidence of fungous or bacterial activity. The condition closely resembles the "bonds" disease of grasses described by George W. Fischer (Phytopath. 31:674-676. 1941).

Corn. A peculiar condition was noted in field corn (about 2 feet high) in many fields in Walthall and Marion Counties. The leaves showed yellow to white to transparent stripes and blotches, and the lowest leaves were withered and frayed. The first 2 to 3 nodes and internodes internally were light brown to purplish, while nodes 2 to 5 were purple. The abnormal plants appeared to be somewhat stunted. Roots, in general, were healthy and the unfurled leaves appeared to be normal. No fungi or bacteria were found on affected plants. Practically all plants in light sandy soils along ridge tops and slopes were affected in this manner, while plants in heavier soils lower down appeared to be healthy. In most cases seed had been selected from last year's crop. In many respects the symptoms resemble

those described by Hoffer and Carr for aluminum and iron toxicity (Journ. Agr. Res. 23: 801-823. 1923). -- Douglas C. Bain, Emergency Plant Disease Prevention Project.

MISSOURI: In so far as possible, a survey of Wheat fields was made during the week ending May 13 along a portion of the Missouri River bottoms and certain of its tributaries to ascertain additional locations of wheat mosaic. Much of the wheat acreage in these bottoms was still under water or had been inundated so long that the wheat had been killed. The fields observed, therefore, represent a relatively small percentage of the acreage originally planted to wheat in these areas. Boone, Howard, Cooper, Saline, Carroll, Livingston, Ray, and Chariton Counties are represented in this survey.

Wheat mosaic (virus) infection was observed in the southern portion of Howard County in the Missouri River bottoms just to the north and east of Booneville; in the northwestern corner of Saline County in the vicinity of Malta Bend and Grand Pass; in the southwestern portion of Carroll County from the vicinity of Carrollton to the Ray County line; and in the southeastern portion of Ray County from the Carroll County line to the vicinity of Richmond. Doubtful mosaic infection was observed in Chariton County near Brunswick. The disease was not observed in Carroll or Livingston Counties. In the latter counties no river-bottom areas were surveyed, but it seems quite possible that a survey of such areas will reveal the presence of mosaic. In all instances the symptoms were mild (but very distinct) and probably very little commercial damage will result from the infection.

Speckled leaf blotch (Septoria tritici) was prevalent in all the fields examined. In general the infection was very vigorous. Without doubt this disease is the most serious one affecting the wheat to date. It is practically impossible, however, to estimate the extent of damage that it is likely to cause.

Leaf rust (Puccinia triticina)[P. rubigo-vera var. tritici] was conspicuous by its absence. Only an occasional pustule on an occasional leaf was observed.

A single field of winter Barley was observed in Cooper County. The plants were in the heading stage. An estimated 1% of the plants showed stripe (Helminthosporium gramineum) infection and had failed to head. A trace of Septoria leaf spot (Septoria passerinii ?) was also observed. -- T. W. Bretz, Emergency Plant Disease Prevention Project.

TEXAS: (May 2). Total precipitation for April was 5.43 inches, which is 1.49 inches above normal. This brings the accumulated departure from normal since January 1 to 4.65 inches. Mean temperatures for the month were almost exactly normal, the minimum for the month being 37° F. on April 3 and the maximum 84° on April 17. Wind-run averaged more than 10 miles per hour for the entire month.

Conditions during April were favorable for the growth of small grains, although too cool and wet for other crops. At this writing, nearly all barley is fully headed, with some early strains well along toward maturity. Wheat and fall-sown oats have nearly all started to head. This is about a week early. Late varieties, such as Tenmarq and Denton, were showing first head on April 30 and May 1, whereas normally they do not head until from

May 6 to 10. It appears that the fruiting period may be abnormally long as the time from first head to full head seems to be unusually long. Owing to cool weather, leaf rust of wheat [Puccinia rubigo-vera var. tritici] has spread slowly and only the most susceptible varieties show marked infection. Stem rust [P. graminis] of wheat was found in one field of wheat north of Dallas on April 25, and on the same trip, crown rust [P. coronata] of oats was found in several fields. Septoria [tritici] is severe on many wheat varieties, having destroyed most of the tissue on the lower 6 to 10 leaves. On some susceptible strains, it has destroyed nearly all leaves. There appear to be few highly resistant strains among the varieties grown this year, although there are marked differences in susceptibility.

During a trip to west Texas in company with Mr. George Altstatt, Pathologist, Emergency Plant Disease Prevention Project, small grain in the Rolling Plains area was observed to have suffered from lack of moisture, large areas in most fields showing a serious deficiency. Fields of Early Blackhull wheat and fall-sown oats were starting to head, much of it so short as to make harvest difficult. A general rain on April 28 may improve prospects some, although for most of the area it did not exceed an inch. A relatively small acreage of barley gave prospects of a low yield. Wheat in the Pandhandle Plains area looked much better than in the Rolling Plains area, with few drought areas.

Few diseases were evident. Leaf rust of wheat was observed as far west as Chillicothe but infection was very light. Septoria was present in all fields and caused some damage, although not so severe as at Denton. All fields of barley showed some spot blotch [Helminthosporium sativum] and most fields of oats showed some leaf spot. Smut [Ustilago] was observed in most fall-sown oats and the amount of infection seemed greater than average. There was a trace of loose smut [Ustilago tritici] in several fields of Early Blackhull wheat. Stem rust of oats was found in one field near Ranger (Eastland County). Flax rust [Melampsora lini] was observed on plants of wild flax near Ranger.

(May 10). Grain continues to make excellent progress owing to very cool weather and ample moisture. Precipitation during the first 10 days of May amounted to more than 2 inches, plus several small showers and dews every morning. In spite of these apparently favorable conditions rust has spread very slowly, undoubtedly as a result of cool weather. Minimum temperature was down to 43° F. on 2 mornings. During the past 3 or 4 days, temperatures have been more favorable for rust, and leaf rust is now getting "under way" with vigor. On a short trip into the western part of the county yesterday, crown rust of oats could be found in nearly every field and stem rust of wheat in many fields. The amount was very small, however, and unless conditions become much more favorable for rust in the immediate future, little damage will result, except on a number of very late fields of wheat; and in the case of oats, on the very late-planted spring oats.

The season in general is very much like that of last year. Cool weather with ample moisture has permitted late-planted spring oats to make almost phenomenal growth. In our experimental nursery, which is well drained and has not been injured by the excessive moisture, spring oats planted on March 15 have made such growth that should conditions continue favorable,

very high yields could be obtained; that is, assuming rust does not seriously damage them.

Septoria continues to be the dominant disease in the wheat nursery and notes on reaction of strains are now being taken. It is the first time such notes have not been complicated by leaf rust. Notes on leaf rust will not be taken for another week, at least. The wheat crop in general continues early, with all varieties fully headed at this early date when usually only the midseason varieties have reached full head. Barley is well along toward maturity and considerable harvesting will be done next week. Owing to the cool weather, barley has filled unusually well. In this area barley varies from some very good fields to almost complete failure on poorly drained land. The same is true of oats, although in this case, the differences are, in part, due to winter injury. In general, wheat in this area is very promising. Some of the material in our nursery is nearly shoulder high and promises very good yields. -- I. M. Atkins, Division of Cereal Crops and Diseases.

KANSAS AND NEBRASKA: Wheat in Kansas. Between April 29 and May 6, 3100 acres of wheat were examined in 26 Kansas counties from Manhattan east to the border counties, south through the second tier of eastern counties to Parsons, thence along the southern counties as far as Dodge City, returning through the central part of the state. Speckled leaf blotch (Septoria tritici) was found in every county ranging from a trace to 45%. In each field estimates were made of secondary infection on living leaves and the amount of Septoria on dead leaves was not considered; thus, the percentage figures following refer to the percentage of living leaves showing lesions of Septoria. Most infections are small, somewhat linear, with yellow border and brown center in which pycnidia were usually found. In the eastern counties the amount of Septoria was generally low, averaging about 2%, except in Neosho County (20%) and Labette County (11%). In the southeastern and south-central counties the wheat is larger and the percentages are generally higher. Through Montgomery, Chautauqua, Cowley, Sumner, and the eastern two-thirds of Harper County, the amount of Septoria ranges from 10 to 45%, averaging 21% in 13 fields. In the western third of Harper County, the amount of Septoria is greatly reduced, averaging 4% in two fields. Westward to Dodge City the amount is slight, varying from a trace to 5%, averaging 1%. In the central counties the amount increases slightly, varying from 2 to 20%, averaging 8%. The best wheat in Kansas is in the central third of the State and it is in these counties that the amount of Septoria is greatest. Winter moisture was more abundant here and the protracted cold wet weather during March and April apparently provided favorable conditions for infection.

No leaf rust nor stem rust was observed on this trip. Leaf rust did not overwinter and fields where it was present last fall are now free from rust. An occasional small black leaf spot (cause not known) was noted, it being fairly abundant in one field in Pottawatomie County.

Rye in Kansas. Leaf rust (Puccinia dispersa) was fairly abundant in fields in Shawnee, Jefferson, Douglas, and Neosho Counties. Leaf blotch (Septoria secalis) was found in several fields averaging approximately 2% in the eastern and south-central counties. In one field in Jefferson County a small amount of powdery mildew (Erysiphe graminis var. secalis) was found.

Wheat in Nebraska. From May 10 to 15 a trip was made through 32 of the southeastern, south-central, and southwestern counties of Nebraska and 4300 acres of wheat were examined. Wheat in this State is somewhat variable. In the southeastern counties wheat is fairly good with many good fields and some very poor ones. In these counties Septoria ranged from a trace to 10%, averaging 3%. In the south-central counties west of a line through Fairbury and Lincoln, wheat was very late in germinating, most stands are poor, and many fields are being abandoned. This area extends approximately as far west as McCook. Septoria in these fields is not abundant. One field had 8%, 4 fields had 1%, 14 had a trace, and 8 had none. In the table lands, particularly of Cheyenne, Perkins, Garden, Deuel, and Chase Counties, the wheat is excellent but Septoria is extremely small in amount, averaging a trace in 29 fields. It was rather surprising to find such a low percentage when the rainfall in this area had been ample.

Leaf rust (Puccinia rubigo-vera var. tritici) was found on May 12 in one field in Franklin County with 3 scattered single pustules, and in Webster County, a trace in one field. Since leaf rust did not overwinter these infections indicate that spore showers are again active in carrying inoculum northward. -- Stuart M. Pady, Emergency Plant Disease Prevention Project.

CALIFORNIA: During the week ending May 13, a trip was made into the coastal areas from San Francisco to Santa Barbara. Although no attempt was made to completely cover the grain fields throughout the areas surveyed, a number of barley, wheat, and oat fields were examined. Most of these were found to be relatively free from disease.

Loose smut (Ustilago avenae) of Oats was found in one field in San Mateo County. An estimated 1% of the heads were infected. A light infection of crown rust (Puccinia coronata) was found in one field near Santa Barbara.

Leaf rust of Wheat (Puccinia rubigo-vera var. tritici) was found in 2 fields. In the southern part of San Mateo County, the wheat in one field was very heavily infected. Every plant seen was infected and all except the uppermost leaves were producing uredia. A few telia were present on the lower leaves. The plants in this field were making poor growth and the heads were short. The other field, which showed a light infection of leaf rust, was found near Los Alamos in Santa Barbara County.

Covered smut of Barley (Ustilago hordei) was found in 3 fields (30 to 50 acres each) in Santa Barbara County. The percentages of infected heads in these fields were estimated as 5, 2, and 1. Stripe (Helminthosporium gramineum) was found in 2 of these fields. In one field there was only a trace to 1% of diseased plants; in the other approximately 15% of the plants were diseased and few of the affected plants had produced heads. Traces of powdery mildew (Erysiphe graminis) were found in several fields. Light infections of scald (Rhynchosporium secalis) were also seen in a few fields. -- Horace L. Barnett, Emergency Plant Disease Prevention Project.

SURVIVAL OF ALFALFA AND CLOVERS IN MINNESOTA

Ian W. Tervet

A survey of alfalfa and clover was made in Washington, Chisago, Pine, Kanabec, Aitkin, Crow Wing, Cass, Wadena, Ottertail, Becker, Clay, Norman, and Mahnomen Counties during the week ending May 14.

East-Central District. A severe reduction in alfalfa and clover stands has occurred in east-central Minnesota. Many fields, principally of alfalfa, were examined and all had suffered winterkilling to a great extent. County agents in the east-central counties stated that a serious shortage of hay and pasture will result from the loss of alfalfa and clover. Substitute annual crops to replace the perennial forage crops will be necessary. The continued wet cool weather over much of this area has delayed spring planting thus complicating still further an already unfavorable situation.

Between 10 and 25% of living alfalfa plants were found in most fields examined, and most of the plants still alive were not vigorous. Many of these plants were rotting at the crowns, while the taproot was apparently uninjured. Dead and decaying alfalfa foliage covered most of the ground, indicating the excellence of the stand and growth in the fall of 1943.

A few fields of red and alsike clover were examined in Pine County. Little living red clover was found on the higher parts of the fields, but good stands of vigorous plants occurred on the lower, wetter soils. Alsike clover likewise was growing well on the low ground, and was persisting on the drier parts of the fields to a greater extent than red clover, although not in very vigorous condition.

It is not unusual in this section of Minnesota for alfalfa and the clovers to be winterkilled and most of the fields examined had been seeded in 1943. The continued dry fall and winter apparently increased the injury during the past winter and losses are higher than in recent years.

Cass, Wadena, Ottertail, and Becker Counties. Severe winterkill was seen in Wadena and Cass Counties, but stands tended to improve in eastern Ottertail County. While all alfalfa irrespective of age suffered severe winterkill in Cass and Wadena Counties, it was mainly the older stands that were injured in Ottertail and Becker Counties. Least injury was seen in Becker County, while in Ottertail great variation in winterkilling was observed. Much of the alfalfa growing on highway embankments had been killed and soil was being lost from the steeper slopes.

Clay, Norman, and Mahnomen Counties. In the Red River Valley, alfalfa survived the winter better than in the lighter soils of the more easterly counties. From Moorhead, Clay County, to Ada in Norman County, only 1 of the 12 fields examined had much winterkill, the stand in this field being extimated at 60% of that of last fall. Most fields showed no signs of injury whatsoever.

On the lighter soils of eastern Norman County, sweetclover replaces alfalfa to some extent. None of the sweetclover fields examined was injured by winterkill, although one field of 18 acres was reported not to have survived the winter. Because of the state of the roads it was impossible to reach this field. Only one alfalfa field in eastern Norman

County suffered much winter injury, a 50% stand remaining. All other alfalfa fields examined in Norman and Mahnomen Counties were in good condition.

EMERGENCY PLANT DISEASE PREVENTION PROJECT.

OTHER REPORTS ON LEGUMINOUS FORAGE CROPS

ALFALFA DISEASES IN PENNSYLVANIA: During the period May 8 to 15 fields of forage legumes were examined in the following central and eastern Pennsylvania counties: Centre, Northumberland, Dauphin, Lycoming, Clinton, Huntingdon, York, Lancaster, Chester, Montgomery, Bucks, Lehigh, Northampton, Luzerne, Wyoming, Susquehanna, and Bradford.

Pseudopeziza leaf spot caused by P. medicaginis was observed on alfalfa in fields everywhere along the route and was already severe in fields near Howard, Doylestown, and Northampton.

Downy mildew caused by Peronospora trifoliorum was noted in one field near Allentown; infection was light on about 25% of the plants. The only other place where this disease was noted was near Northampton where but a trace of infection was observed.

What appeared to be the blackstem disease, caused by Ascochyta imperfecta, was noted at widely separated points. This disease was especially destructive near Stormstown in central Pennsylvania. Since pycnidia of the organism were not present it cannot be stated definitely that this is the Ascochyta disease. Tissue cultures have been made.

Mosaic (virus) was commonly present in most fields of alfalfa and in a few as high as 5% infection was noted. -- Leon J. Tyler, Emergency Plant Disease Prevention Project.

DISEASES OF VARIOUS LEGUMES IN MISSISSIPPI: The Delta area and the southwest section were visited during the week ending May 13. Heavy rains and floods have occurred during the past 2 months.

Halo blight (Pseudomonas medicaginis var. phascolicola) was found to be fairly common on kudzu vines in the vicinity of Natchez. These vines were growing on highway cuts through the loessal ridges of that area.

Anthracnose (Colletotrichum viciae) on leaves and stems, and powdery mildew (Erysiphe polygoni) were found to be common on large plantings of Vetch.

Leaf spot (Cercospora zebrina) is common on lower leaves of crimson clover, and powdery mildew occurs on Trifolium dubium, throughout the areas visited.

Powdery mildew appeared to be doing considerable damage in one large field (about 25 acres) of Austrian winter pea in Warren County. -- Douglas C. Bain, Emergency Plant Disease Prevention Project.

REPORTS ON DISEASES OF FRUIT CROPS

SCAB AND OTHER DISEASES OF APPLE IN OHIO: The apple scab disease (Venturia inaequalis) was reported from near Jackson on April 26. It was found on apple leaves near South Bloomingville during the past week. On May 8, first lesions were found on an unsprayed tree near Lancaster. These observations were made 50 miles north of those last reported.

Fireblight (Erwinia amylovora) was found in one 50-acre apple orchard near Lexington. In a number of trees blighted flower clusters were evident.

In one hillside orchard where black rot (Physalospora obtusa) was severe on the twigs last year a few lesions of the fungus were found on the leaves.

The results of winter and spring spraying of various fruit trees has been closely checked. Generally speaking, diseases of apple, peach, sour cherry, and pear have been controlled adequately up to the present. Inspections indicate that apple growers are controlling apple scab. At the present time spores from Venturia inaequalis perithecia are pretty well discharged over the southern 2/3 of the State. During the week of May 8 to 13, rains in the northern part of the State brought about the heaviest spore discharge of the season. -- M. R. Harris, Emergency Plant Disease Prevention Project. May 1 - 13.

PEACH DISEASES IN OHIO: On a few unsprayed trees south of Columbus, leaf curl (Taphrina deformans) was present but doing little damage. Several commercial orchards ranging from the Ohio River north to Columbus were examined but no leaf curl was observed. A trace of brown rot (Sclerotinia [Monilinia] fructicola) causing a twig infection was found in one tree. -- M. R. Harris, Emergency Plant Disease Prevention Project. May 1 - 13.

PEACH LEAF CURL IN MISSOURI: Throughout the area covered during the week ending May 13, along the Missouri River and some of its tributaries in Boone, Howard, Cooper, Saline, Carroll, Livingston, Ray, and Chariton Counties, peach trees in home plantings were observed to be seriously affected by peach leaf curl (Taphrina deformans). Practically 100% of the foliage was diseased and the trees were conspicuous from a distance because of their orange-red color. Probably none of these trees had been sprayed. A commercial orchard in Livingston County, in which a large block of peach trees was set out a few years ago, was inspected for the prevalence of leaf curl. The majority of the trees had received a dormant spray about 4 to 6 weeks ago. A few were not sprayed, owing to the fact that sufficient spray material was not on hand to complete the job and since, as the grower expressed it, "leaf curl never caused damage before". The foliage of the unsprayed trees was practically 100% diseased and p r a c t i c a l l y a l l o f t h e s p r a y e d trees showed a small percentage of the foliage affected. Since, in this area, the fruit buds were killed by unfavorable temperatures, the disease will not be a factor so far as the current season's production is concerned. -- T. W. Bretz, Emergency Plant Disease Prevention Project.

HAIL INJURY TO PEACH AND OTHER STONE FRUIT TREES, AND PEACH DISEASES IN CALIFORNIA: While in the Sacramento Valley during the week ending May 6, a trip was made to the peach-growing district near Yuba City and Marysville in Sutter and Yuba Counties, where the hail had recently caused considerable injury to peaches and other stone fruit. Counts were made in a number of orchards to determine the percentage of injured fruits. According to these counts the percentage of peach fruits visibly injured by the hail varied from 20 to 40. The greatest damage was seen in an orchard just south of Marysville.

In addition to the damage to the peach fruits the injury to the small branches was rather severe. It was not uncommon to find 3 to 5 hail injuries (breaks in the bark) per foot on these small branches. Damage to the foliage was not great. Approximately the same damage was noted in prune and cherry orchards in this region. In some orchards the peaches were being thinned at this time. An effort was apparently being made to remove all of the injured fruit but it was evident that some injured fruit remained on the trees after thinning. Some reduction in yield or grade will probably result.

Light infections of powdery mildew (Sphaerotheca pannosa) on peach fruits were noted in the Yuba City-Marysville district. Only a trace of leaf curl (Taphrina deformans) was seen on leaves. Shot hole (Coryneum beijerinckii) [C. carpophilum] was present in some orchards in small amounts and causing very little damage. -- Horace L. Barnett, Emergency Plant Disease Prevention Project.

RUST AND MOSAIC ON RASPBERRIES IN OHIO: A 4-year-old planting of raspberries covering 25 acres was examined. The orange rust (Gymnoconia interstitialis) [G. peckiana] was present in one portion of the planting and was just beginning to be noticeable. It seems quite possible that this disease will cause severe damage in this planting unless promptly rogued out.

Mosaic (virus) was also present and had infected about 5% of the plants prior to this year. The grower has been removing infected plants as soon as observed. He stated that in another year or two the planting would be too thin to be maintained profitably. -- M. R. Harris, Emergency Plant Disease Prevention Project. May 1 - 13.

DISEASES OF STRAWBERRY IN TENNESSEE: Strawberry fields were surveyed in the vicinity of Portland on May 11. Many of the farmers have reduced or eliminated their acreage because of the labor shortage. The Blakemore variety only was encountered in this survey. Gray mold rot, Botrytis cinerea, was the worst diseased encountered. It was present in all fields and in some was estimated to have rotted 30% of the green and ripe berries present at the start of the picking season. Yellows, a non-pathogenic trouble of the Blakemore variety, was a minor problem, being present to the extent of a trace to 1% in a few fields. Leaf spot, Mycosphaerella fragariae, was always present and rather abundant in a few cases, but apparently of little economic importance. The strawberry weevil was present in some abundance in a few fields. -- R. A. Hyre, Emergency Plant Disease Prevention Project.

STRAWBERRY DISEASES IN OHIO: Plantings in Franklin County around Columbus were inspected for disease. One planting of several acres exhibited all the gross symptoms of the red stele disease (Phytophthora fragariae). When examined internally the stele was brick red in color. Some mycelial strands in the cells resembled those of Phytophthora but no oögonia could be seen in the infected tissue. A further check will be made to clear up this point.

In all of the plantings inspected traces of leaf spot (Mycosphaerella fragariae) could be found but all growers insisted that it caused no appreciable damage.

Near Dayton, in Montgomery County, 60 acres of strawberries were inspected for damage from disease. No red stele was found. Traces of the Mycosphaerella leaf spot were present in most plantings. The growers in this area are familiar with the red stele disease and demand adequate inspection of the nursery plants to insure freedom from this trouble. -- M. R. Harris, Emergency Plant Disease Prevention Project. May 1 - 13.

BRIEF NOTES ON PLANT DISEASES

EXOBASIDIUM GALLS ON CAMELLIA SPP.: The fungus Exobasidium camelliae Shirai and the galls it causes have been reported only rarely in the United States. In the "Revised Checklist of Diseases of Economic Plants of the United States" by Dr. Freeman Weiss, the fungus is reported from Louisiana and Mississippi but it is not stated clearly whether on Camellia japonica L. or C. sasanqua Thunb. or both. In Florida, specimens have been collected several times during the past 5 years on both these species. All of the collections have been made in counties in the western part of the State. All of the specimens received so far consist of affected leaves or leaves and stems. No flower infection has been observed. In no case has infection been severe, either on individual plants or on entire plantings. Recently, specimens were received from southern Georgia showing the disease on a young shoot of C. sasanqua.

This disease, which originated in Japan, has evidently been introduced into the Southeastern States and is spreading slowly over the area in which camellias are planted. Since no native host plants are known, it seems that a concerted effort to eradicate it would offer considerable promise of success. Careful handpicking and destruction of all affected organs in nurseries and on private plantings would certainly minimize its dissemination. -- Erdman West, Agricultural Experiment Station, Gainesville, Florida.

DISEASES OBSERVED DURING APRIL ON VARIOUS PLANTS IN TEXAS: Sycamore anthracnose (Gnomonia veneta) has caused rather extensive defoliation in East Texas. Farmers frequently identify the trouble as "frost damage".

Leaf spot of Oenothera sp. (Septoria oenotherae *) has been extensive in East and Central Texas. According to Dr. P. A. Young, this plant (probably O. laciniata *) is a useful forage plant in East Texas.

Buckeye leaf spot (Phyllosticta paviae *) was common on the wild plants

of Aesculus sp. in and about Jacksonville and Wells.

Zanthoxylum sp. growing near Wells was infected by Puccinia andropogonis*.

Leaves of cultivated iris in a home garden at Wells were severely damaged by Heterosporium iridis*.

(*Identifications by Dr. D. A. Preston). -- George E. Altstatt, Emergency Plant Disease Prevention Project.

SOROSPHAERA ON VERONICA IN SOUTH CAROLINA: Sorosphaera veronicae, an interesting species of the Plasmodiophoraceae, was found on the weed speedwell (Veronica peregrina). -- R. E. Atkinson, Emergency Plant Disease Prevention Project. May 1 - 6.

A CORRECTION: Glenn KenKnight makes the following corrections in the paper on "Diseases of Vegetable Crops in Idaho in 1943" by Glenn KenKnight and Earle C. Blodgett, PDR 28 (6), Mar. 15, 1944.

Page 193, second line: "the second week in April" should read "the second week in June."

Page 196, eighth line: "near Hagerman" should read "near Hazelton".

COLOR PRESERVATION DURING THE DRYING OF FLESHY GREEN PLANT PARTS: In the summer of 1943 specimens of young corn smut boils were placed in a refrigerator at 5° C. for temporary storage. Upon removal some time later, it was observed that the green color was retained in the husks. Later, lima bean pods affected with downy mildew and bean pods bearing anthracnose lesions were dried at 5° C. with satisfactory retention of green color. In the refrigerator used, the drying process required several days for bean pods, several months for a summer squash.

To test the permanence of the color retention, pods of a number of varieties of pole beans were dried in the refrigerator. Duplicate samples were prepared January 1, 1944, and subsequently were stored under different conditions. Samples were placed in beakers exposed to light at room temperature, in paper bags at room temperature, and under refrigeration at 5° C. When examined May 12, 1944 no color loss was noted on the samples protected from the light at any temperature and very slight loss was detected on the sample exposed to daylight for more than 5 months.

Low temperature drying has protected against the loss of green color in fleshy plant material such as the pods of beans. By this method characterisitc coloration of specimens of downy mildew of lima beans and of anthracnose of beans has been successfully retained during the drying process and for several months thereafter.--Carlton F. Taylor, Emergency Plant Disease Prevention Project.

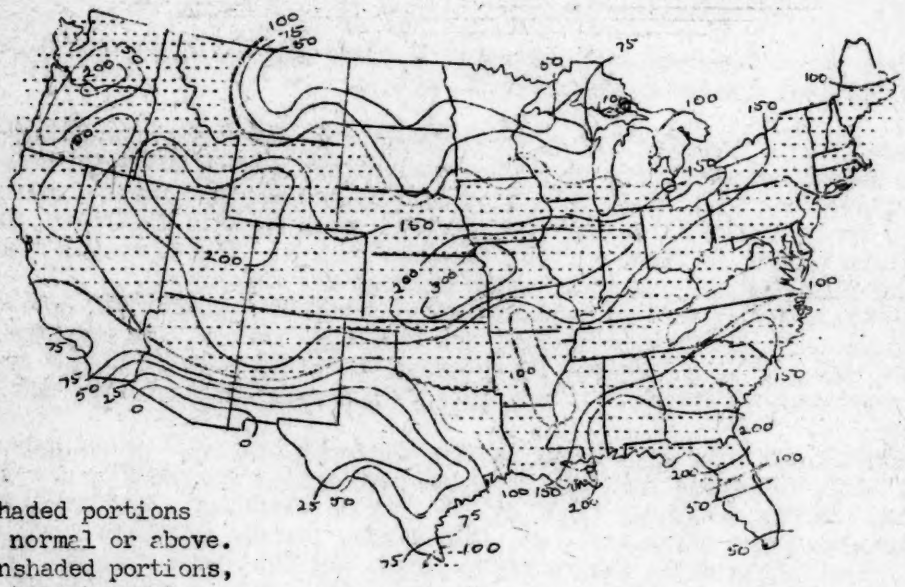
APRIL WEATHER

(From U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for week ending May 2, 1944).

Maps 1 and 2 show for the month of April the departure of temperature from normal and the percentage of normal rainfall, respectively, based on first-order stations. This month had approximately normal temperatures in the south Atlantic areas, Texas, south Pacific districts, and northern border sections west of the Lake region. Elsewhere the month was colder than normal, decidedly so in most of the interior.

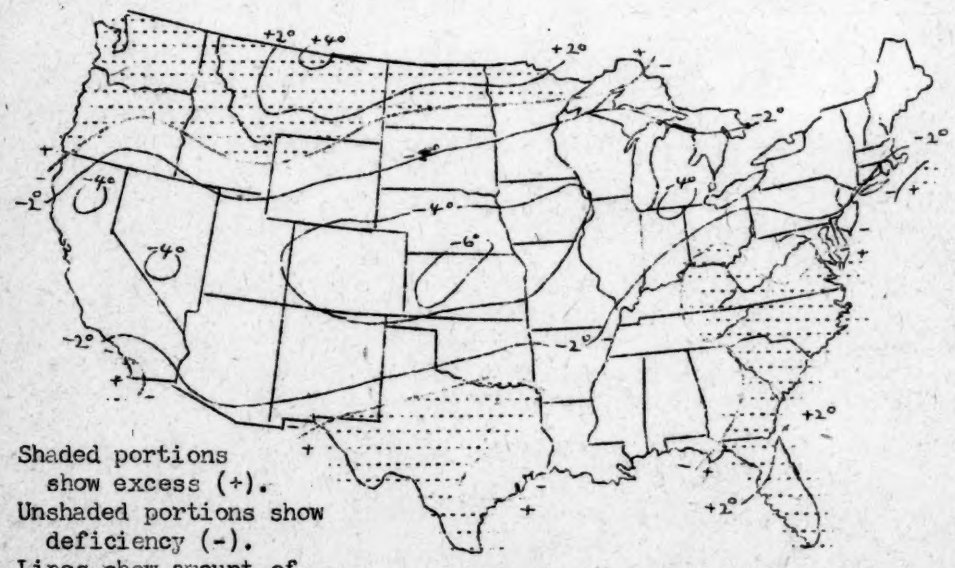
For the country as a whole 1943 made 3 successive years with April temperature appreciably above normal and t h i s number, for consecutive years, has not been exceeded in the climatological history of the country. The record still stands, for the 1944 nation-wide April average was below normal.

Rainfall was extremely heavy in the Southeast and over an interior East-West belt, extending from the northern Ohio Valley westward to the Great Basin. It was decidedly light in the extreme Southeast, Southwest and central-northern districts. St. Louis, Mo., had the greatest April rainfall since 1893, while Kansas City, Omaha, and Salt Lake City all had the greatest in more than 70 years. Columbia, Mo., had the greatest of record and Wichita, Kansas, 70 percent more than ever previously recorded for the month. Peoria, Illinois, had the wettest April in its weather history which began in 1856.



Shaded portions
normal or above.
Unshaded portions,
below normal.

Map. II - Percentage of normal precipitation, for April 1944.



Shaded portions
show excess (+).
Unshaded portions show
deficiency (-).
Lines show amount of
excess or deficiency.

Map. I - Departure of mean temperature from the normal, for April 1944.